

Air Force Research Laboratory

Air Force Research Laboratory (AFRL) is a full-spectrum laboratory responsible for planning and executing the Air Force's entire science and technology program. The largest laboratory complex in the Department of Defense, AFRL has an annual budget of nearly \$2.8 billion, almost half provided by customers, and a staff of about 6,000 military and civilian scientists, engineers, and support personnel.

The AFRL mission is to lead the discovery, development, and timely transition of affordable, integrated technologies that keep the Air Force the best in the world. AFRL is organized along technology disciplines into nine technology directorates plus the Air Force Office of Scientific Research.

Each technology directorate performs, procures, and synthesizes basic research, exploratory technology development and advanced technology development within its area of responsibility. The directorates are: Space Vehicles Directorate, Air Vehicles Directorate, Information Directorate, Munitions Directorate, Directed Energy Directorate, Materials and Manufacturing Directorate, Sensors Directorate, Propulsion Directorate, and the Human Effectiveness Directorate.

For more information on AFRL, visit
www.afrl.af.mil, email
public_affairs@afrl.af.mil or call
(937) 656-9876.

Materials and Manufacturing Directorate

*“Keeping the U.S. Air Force Strong
Through Materials, Processes and
Manufacturing Research”*

Materials and Manufacturing Directorate

- More than 80 years of aerospace materials and manufacturing research and development
- Over 400 government scientists and engineers on staff
- More than one-half million square feet of modern research facilities
- Providing national leadership in aerospace materials, processes, and manufacturing research

“One team, working together to grow stronger and to serve better, providing materials and manufacturing processes for the entire Air Force, emphasizing technical leadership, technology transition, and systems support.”

For more information, contact the
Materials and Manufacturing Directorate's
Technology Information Center at
techinfo@ml.wpafb.af.mil, call
(937) 255-6469 (DSN 785-6469) or visit
www.afrl.af.mil



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Materials and Manufacturing Directorate



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Materials and Manufacturing Directorate

Air Force Research Laboratory's Materials and Manufacturing Directorate performs comprehensive research and development activities to provide new or improved materials, processes and manufacturing technologies that help keep the U.S. Air Force the best in the world. Current research emphasis for scientists and engineers at Wright-Patterson Air Force Base, near Dayton, Ohio and Tyndall Air Force Base, near Panama City, Florida, is on thermal protection materials, metallic and nonmetallic structural materials, nondestructive inspection methods, materials used in aerospace propulsion systems, electromagnetic and electronic materials, laser hardened materials, materials process design techniques, environmental protection technologies, and airbase infrastructures. Additionally, the Directorate integrates Air Force and industry requirements with an execution program providing advanced manufacturing processes, techniques and systems for timely, reliable, high quality, economical production and sustainment of Air Force systems.

With a host of modern materials analysis laboratories, the Directorate provides support to Air Force weapon system acquisition offices and maintenance depots to solve materials-related concerns and problems. Through highly selective in-house and contracted research efforts, the Materials and Manufacturing Directorate maintains a vigorous program to reduce costs, improve reliability and enhance the performance of Air Force aircraft, missile systems, spacecraft and related support equipment. The Directorate also provides technical assistance to the Air Force, other Department of Defense agencies, and the aerospace community in systems studies, tests, evaluation, acquisition, modification, and operation of both current and future defense systems.

Among the Directorate's many accomplishments are carbon-carbon composites for high temperature propulsion and re-entry vehicle applications, advanced structural composites, laser-hardened goggles for personnel protection, and nondestructive computer-aided tomography inspection techniques. The Directorate is divided into seven divisions:

Nonmetallic Materials Division (MLB)

Structural Materials
Nonstructural Materials
Polymer

Metals, Ceramics, and Nondestructive Evaluation Division (MLL)

Metals Development and Materials Processing
Ceramics Development and Materials Behavior
Nondestructive Evaluation

Survivability and Sensor Materials Division (MLP)

Laser Hardened Materials
Electronic and Optical Materials
Heterojunction Physics

Manufacturing Technology Division (MLM)

Manufacturing and Engineering Systems
Metals/Nonmetals Processing and Fabrication
Electronics Processing and Fabrication
Advanced Industrial Practices
Materials Process Design

Systems Support Division (MLS)

Materials Integrity
Acquisition Systems Support
Logistics Systems Support

Airbase and Environmental Technology Division (MLQ)

Environmental Technology Development
Basic and Applied Research
Airbase Technology

Integration and Operations Division (MLO)

Facilities Support
Communications and Computers
Human Resources Support
Logistics Support
Plans and Programs

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and Manufacturing Directorate visit
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Research Areas

Advanced Industrial Practices
Advanced Inspection Technologies
Advanced Materials Process Control
Advanced Metals and Intermetallics
Air Mobile Systems Research
Air Quality Research
Airbase Infrastructure Technologies
Aircraft and Spacecraft Coatings
Analytical Chemistry Research
Atmospheric Technologies
Biomaterials for Laser-Hardening Applications
Biosystems Technologies
Ceramics and Ceramic Matrix Composites
Chemical Analysis
Chemical Process Engineering
Composites Supportability
Computational Chemistry
Computed Tomography
Corrosion Control
Electronics
Electrostatic Discharge Research
Engineering and Design Data
Environmental Technologies
Fire Protection Training Research
Fire Suppression Technologies
Fluids, Lubricants and Tribological Research
Hazardous Materials Elimination/Minimization
High Resolution Flaw/Feature Imaging
High-Temperature Superconductor Materials
Infrared Detector Materials
Laser-Hardened Materials
Manufacturing and Engineering Systems
Materials Behavior and Evaluation
Materials Life Prediction
Mechanics of Composites
Metal Matrix Composites
Nondestructive Evaluation
Nonmetallic Composite Materials
Optical Sensor Protection
Pollution Prevention
Polymer Synthesis
Quantitative Defect Characterization
Robotics Research
Semiconductor Materials
Sensor Technologies
Solid and Liquid Lubricant Development
Structural and Electronic Failure Analysis
Superlattice and Quantum Well Materials
Surface Phenomena/Interactions
Systems Support
Thermal Protection Materials
Virtual Reality Training